

Serial No. 10/713,836
Amendment Dated January 31, 2007
Reply to Office Action of November 1, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An isolated nucleic acid molecule comprising one nucleotide sequence selected from the group consisting of:
 - (a) the nucleotide sequence set forth in SEQ ID NO:1;
 - (b) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:2;
 - (c) a nucleotide sequence having at least ~~80%~~ 90% identity to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence encodes a polypeptide having mannan synthase activity;
 - (d) a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having mannan synthase activity;
 - (e)(d) a fragment of the nucleotide sequence set forth in SEQ ID NO:1, wherein said fragment encodes a polypeptide having mannan synthase activity; and
 - (f)(e) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), ~~or (e)~~ or (d).
 - (g) ~~the nucleotide sequence set forth in SEQ ID NO:3;~~
 - (h) ~~a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:4;~~

- (i) ~~a nucleotide sequence having at least 80% identity to the nucleotide sequence set forth in SEQ ID NO:3, wherein said nucleotide sequence encodes a polypeptide having galactosyltransferase activity;~~
- (j) ~~a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:3, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having galactosyltransferase activity;~~
- (k) ~~a fragment of the nucleotide sequence set forth in SEQ ID NO:3, wherein said fragment encodes a polypeptide having galactosyltransferase activity; and~~
- (l) ~~a nucleotide sequence that is complementary to the nucleotide sequence of (g), (h), (i), (j), or (k).~~

2. (Currently Amended) An expression cassette comprising a nucleotide acid molecule of claim 1 operably linked to a promoter that drives expression in a non-human host cell.

3. (Original) A vector comprising the expression cassette of claim 2.

4. (Original) A non-human host cell having stably incorporated in its genome the expression cassette of claim 2.

5. (Currently Amended) A plant cell having stably incorporated in its genome the ~~nucleotide construct~~ expression cassette of claim 2.

6. (Currently Amended) A transformed plant comprising in its genome at least one stably incorporated nucleotide construct comprising a nucleotide sequence operably linked to a promoter that is capable of driving expression

in a plant cell, wherein said nucleotide sequence is selected from the group consisting of:

- (a) the nucleotide sequence set forth in SEQ ID NO:1;
- (b) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:2;
- (c) a nucleotide sequence having at least 80% 90% identity to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence encodes a polypeptide having mannan synthase activity;
- (d) ~~a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having mannan synthase activity;~~
- (e)(d) a fragment of the nucleotide sequence set forth in SEQ ID NO:1, wherein said fragment encodes a polypeptide having mannan synthase activity; and
- (f)(e) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), ~~or (e); or (d)~~.
- (g) ~~the nucleotide sequence set forth in SEQ ID NO:3;~~
- (h) ~~a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:4;~~
- (i) ~~a nucleotide sequence having at least 80% identity to the nucleotide sequence set forth in SEQ ID NO:3, wherein said nucleotide sequence encodes a polypeptide having galactosyltransferase activity;~~
- (j) ~~a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:3, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having galactosyltransferase activity;~~

(k) ~~a fragment of the nucleotide sequence set forth in SEQ ID NO:3, wherein said fragment encodes a polypeptide having galactosyltransferase activity; and~~

(l) ~~a nucleotide sequence that is complementary to the nucleotide sequence of (g), (h), (i), (j), or (k).~~

7. (Cancelled)
8. (Original) The plant of claim 6, wherein said plant is a monocot.
9. (Original) The plant of claim 8, wherein said monocot is selected from the group consisting of maize, wheat, rice, sorghum, rye, millet, and barley.
10. (Original) The plant of claim 6, wherein said plant is a dicot.
11. (Original) The plant of claim 10, wherein said dicot is selected from the group consisting of soybean, sunflower, safflower, alfalfa, potato, *Brassica* spp., cotton, tomato, tobacco, peanut, guar, locust bean, and fenugreek.
12. (Original) The plant of claim 6, wherein said promoter is selected from the group consisting of constitutive, pathogen-inducible, chemical-regulated, wound-inducible, and insect-inducible promoters.
13. (Original) A seed of the plant of any one of claims 6-12, wherein said seed comprises in its genome at least one of said nucleotide constructs.
14. (Currently Amended) A method for altering the level of galactomannan in a plant, said method comprising transforming a plant with a nucleotide construct

comprising a nucleotide sequence operably linked to a promoter that is capable of driving expression in a plant cell, wherein said nucleotide sequence is selected from the group consisting of:

- (a) the nucleotide sequence set forth in SEQ ID NO:1;
- (b) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:2;
- (c) a nucleotide sequence having at least 80% 90% identity to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence encodes a polypeptide having mannan synthase activity;
- (d) ~~a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having mannan synthase activity;~~
- (e)(d) a fragment of the nucleotide sequence set forth in SEQ ID NO:1, wherein said fragment encodes a polypeptide having mannan synthase activity; and
- (f)(e) a nucleotide sequence that is complementary to the nucleotide sequence of (a), (b), (c), (d), ~~or (e); or (d)~~.
- (g) ~~the nucleotide sequence set forth in SEQ ID NO:3;~~
- (h) ~~a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:4;~~
- (i) ~~a nucleotide sequence having at least 80% identity to the nucleotide sequence set forth in SEQ ID NO:3, wherein said nucleotide sequence encodes a polypeptide having galactosyltransferase activity;~~
- (j) ~~a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:3, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having galactosyltransferase activity;~~

(k) ~~a fragment of the nucleotide sequence set forth in SEQ ID NO:3, wherein said fragment encodes a polypeptide having galactosyltransferase activity; and~~

(l) ~~a nucleotide sequence that is complementary to the nucleotide sequence of (g), (h), (i), (j), or (k)~~

15. (Original) The method of claim 14, wherein said method further comprises regenerating a stably transformed plant from said cell.

16. (Original) The method of claim 14, wherein said plant is a monocot.

17. (Original) The method of claim 16, wherein said monocot is selected from the group consisting of maize, wheat, rice, sorghum, rye, millet, and barley.

18. (Original) The method of claim 14, wherein said plant is a dicot.

19. (Original) The method of claim 17, wherein said dicot is selected from the group consisting of soybean, sunflower, safflower, alfalfa, potato, *Brassica* spp., cotton, tomato, tobacco, peanut, guar, locust bean, and fenugreek.

20. (Original) The method of claim 14, wherein said promoter is selected from the group consisting of constitutive, pathogen-inducible, chemical-regulated, wound-inducible, and insect-inducible promoters.

21. (Original) A method for producing gum comprising:

(a) obtaining a transformed plant, said transformed plant comprising in its genome a nucleotide construct comprising a nucleotide sequence

encoding a mannan synthase, said nucleotide sequence operably linked to a promoter that is capable of driving expression in a plant cell;

- (b) maintaining said transformed plant under conditions favorable for the production of gum in said transformed plant or in at least one part thereof;
- (c) harvesting said transformed plant or said part; and
- (d) extracting said gum from said plant or said part.

22. (Currently Amended) The method of claim 21, wherein said nucleotide sequence encoding a mannan synthase is selected from the group consisting of:

- (a) the nucleotide sequence set forth in SEQ ID NO:1;
- (b) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO:2;
- (c) a nucleotide sequence having at least 80% 90% identity to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence encodes a polypeptide having mannan synthase activity; and
- (d) ~~a nucleotide sequence that hybridizes under stringent conditions to the nucleotide sequence set forth in SEQ ID NO:1, wherein said nucleotide sequence, or complement thereof, encodes a polypeptide having mannan synthase activity; and~~
- (e)(d) a fragment of the nucleotide sequence set forth in SEQ ID NO:1, wherein said fragment encodes a polypeptide having mannan synthase activity.

23-29. (Cancelled)

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30. (Currently Amended) The method of claim 14, wherein said plant nucleotide construct additionally comprises a GDP-mannose transporter polynucleotide in soybean selected from the group consisting of:

- (a) the nucleotide sequence set forth in SEQ ID NO: 9; and
- (b) a nucleotide sequence encoding the amino acid sequence set forth in SEQ ID NO: 10.